1. **Identification of Unknowns ( Note: Unknowns 1 and 2 are mixtures) – 52 points**
2. Flour and Salt 7. Sugar
3. Baking Soda and Alka Seltzer 8. Sodium Acetate
4. Corn Starch 9. Tin
5. Gelatin 10. Zinc
6. Sand 11. Ammonia
7. Calcium Sulfate 12. Hydrogen Peroxide
8. **Hairs, Fibers or Plastics (6 points)**

13. Identify the type of hair found at the crime scene? \_\_\_\_\_\_\_\_\_\_\_\_\_ cat

14. Write out the full names of the following polymers

a. PETE : \_\_\_\_\_\_\_Polyethylene Terepthalate\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. LDPE : \_\_\_\_\_\_\_Low Density polyethylene\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Chromatography (5 points - 4 + 1)**

The note found at the crime scene was analyzed using chromatography. The chromatograph of the ink used to write the note is below. Match the chromatogram from the crime scene with one of those you made from each of the four pens provided at your supply area. (**Attach all your chromatograms to the bottom of this sheet.**)

14. Which suspect pen was most likely used to write the note?

Pen 3 (Hook)

1. **Crime Scene Evidence (12 points)**

15. Suspects with fingerprints matching those found at the crime scene: (2 points )

Hook and Dory

16. What type of fingerprint is this? ( 2 point)

Whorl

17. From the blood spatter found at the crime scene, was the person who was bleeding standing, walking or running? (2 points)

Standing

18. What was the most likely angle of impact of the spatter pattern? (2 points)

90 degrees

19. Soil found on the shop floor was reddish in color. What compound does this soil contain? (2 points)

Iron

20. Suspect #4 soil sample taken from shoes contained: 50% clay, 40% sand, and 10% silt.

They had what type of soil in their boots? (2 points)

Clay

**e. Analysis (25 points)**

Describe who is/are the main suspect(s) and who is/are not the suspect(s). Draw conclusions based on the evidence and scenario.

Suspect #1, Skipper probably did not commit the crime. Not enough evidence (any 3) 1 point for each suspect and 1 point for each reason – total 4

1. Fingerprint did not match the ones found at the crime scene
2. Of the unknowns flour, salt, gelatin, sugar, calcium carbonate, zinc and Ammonia are found with Skipper but he was a customer at the store
3. The shoe print found at the crime scene did not match Skippers
4. The chromatogram of the pen found with skipper didn’t match the one from the note found at the crime scene
5. Cat hair was found at the crime scene and skipper had a pet dog

Suspect # 2, Fixit probably did not commit the crime. Even though he has a pet cat and some unknowns were found on him, other evidences did not point to him (1+ 3)

1. Fingerprint did not match the ones found at the crime scene
2. Of the unknowns only sugar, calcium carbonate, tin and hydrogen peroxide were found with fixit
3. The shoe print found at the crime scene did not match Skippers
4. The chromatogram of the pen found with Fixit didn’t match the one from the note found at the crime scene
5. Cat hair was found at the crime scene and Fixit has a pet cat

Suspect #3 Hook is the main suspect (3 point s for identification – any 5) (3 + 2 x 5)

(2 points each for the correct motives)

1. One of the fingerprints found on the crime scene belonged to Hook
2. The chromatogram of the pen found with Hook matched with the chromatogram from the note found at the crime scene
3. Of the unknowns flour, salt, gelatin, sugar, zinc and hydrogen peroxide were found with Hook
4. Cat hair was found at the crime scene and Hook has a pet cat
5. The shoe print found at the crime scene was Hooks
6. Had a fight with Sam

Suspect #4, Dory probably did not commit the crime. Not enough evidence (1+3)

1. Fingerprint did match the ones found at the crime scene but she cleans the sandwitch place.
2. Of the unknowns only gelatin, calcium carbonate, tin and ammonia were found with Dory
3. The shoe print found at the crime scene did not match Dorys
4. The chromatogram of the pen found with Dory didn’t match the one from the note found at the crime scene
5. Cat hair was found at the crime scene and Dory don’t have any pets.